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ABSTRACT

This information brief contains information on what environmental education is, how and where it is practiced, some of the current research, resources, and a summary of recommendations for promoting the field. Specific sections include linking environmental education and formal education, sustaining programs, and challenges to implementing environmental education in schools. (MM)

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Environmental Education: Moving into the Educational Mainstream.

Amy Eckman, Editor

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INFOBRIEF

AN INFORMATION BRIEF OF THE ASSOCIATION FOR SUPERVISION AND CURRICULUM DEVELOPMENT

Moving into the Educational Mainstream

Grassroots support has traditionally been the lifeblood of environmental education in the United States, and such local involvement has brought a diversity of approaches and programs. Unfortunately, these differing approaches, along with the lack of a unified presence and inconsistent support at the national, state, and local levels, have hindered efforts to incorporate environmental education as an integral part of the K–12 curriculum.

For decades, many educators have recognized the potential for this field to contribute to top-quality education, but the larger community is only now recognizing its promise. Among the factors propelling environmental education out of the fringes and into the educational mainstream are links between environmental education and current directions in education reform, and a growing infrastructure to support environmental education programs at the state and local levels.

Although diverse in approach and application, the practice of environmental education is characterized by some essential elements and perspectives. Environmental education

- Is based on knowledge about ecological and social systems, drawing on disciplines in the natural sciences, social sciences, and humanities.
- Reaches beyond biological and physical phenomena to consider social, economic, political, technological, cultural, historical, moral, and aesthetic aspects of environmental issues.
- Acknowledges that understanding the feelings, values, attitudes, and perceptions at the heart of environmental issues is essential to exploring, analyzing, and resolving these issues.
- Emphasizes critical thinking and problem-solving skills needed for informed, well-reasoned personal decisions and public action (Disinger & Monroe, 1994).

As this approach to education gains recognition and legitimacy among educators and policymakers, some questions about its role in formal education emerge:

- How can environmental education help achieve educational goals?
- How can comprehensive environmental education programs that advance student achievement be initiated and maintained?
- Who needs to be involved and in what ways to ensure top-quality environmental education?

Environmental Education and Current Movements in Education

Proponents of environmental education believe it supports current directions in education reform that emphasize higher-order thinking skills, links to the real world, and integration of knowledge and action skills across disciplines (Iozzi & Marcinkowski, 1990; Champeau, 1992).

"Environmental education promotes good science, serious debate, and thoughtful action," says Deborah Simmons, director of the National Project for Excellence in Environmental Education, an initiative of the North American Association for Environmental Education. "Largely because of its focus on citizenship, environmental education is compatible with other educational approaches that are now coming into their own, such as service learning, character education, and education for democratic participation." These educational approaches also share a common commitment to making education relevant to students' lives outside classroom walls. They extend their reach beyond the traditional "knowledge and skills" approach to education, with lessons that encompass feelings, beliefs, and actions. This comprehensive approach is a powerful tool for the social, emotional, and intellectual growth of students.

Environmental education, and service learning in particular, empower students to take responsibility for the environment and quality of life in the communities around them. In the Rio Grande watershed along the U.S.-Mexico border, a binational, bicultural, bilingual program called Project del Rio pairs service learning and environmental education. Teams of students select environmental problems in the watershed to investigate and act on. For instance, high school students from Gadsden, N.M., studied the health effects associated with shallow wells and inadequate septic systems. Supervised by the New Mexico Border Health Office, students ran water quality tests on wellheads in *colonias* (shantytowns) and conducted epidemiological surveys. Findings were used in the Border Health Advisory Board's annual assessment of health in the *colonias*, which guides efforts to protect and improve health in these poor border communities (Archie, 2001).

Environmental education engages students' minds and hands, often in real-world investigations that are inquiry-based, interdisciplinary, and supportive of a standards-based curriculum. In the wake of a devastating hurricane that destroyed most of the landscaping work at Village Pines School in south Florida, a class of 5th and 6th grade students undertook an interdisciplinary project that helped restore the school environment. Students created a butterfly garden, and in the process, honed mathematics, language, communication, artistic, research, and observation skills (Archie, 2000).

Environmental education also helps familiarize students with careers in environmental fields. Career opportunities related to environmental protection range from manual labor to high-tech jobs. According to the congressionally mandated Task Force on Women, Minorities, and the Handicapped in Science and Technology, environment-related fields represent a significant source of skilled jobs with good pay for low-income persons (1989). Advocates also believe that environmental education can help redress the significant underrepresentation of minorities in careers related to the environment by increasing their access to role models, opportunities, and career information (McCrea, McGlauflin, & Simmons, 1996).

Advancing Student Achievement

For more than a decade, the educational reform movement in the United States has focused on setting standards for learner achievement. In the early 1990s, mandated by the Goals 2000 federal education reform act, professional associations in the traditional disciplines began to establish voluntary standards. As standards were being set in science, social studies, history, language arts, and other fields, environmental educators also began developing a comprehensive set of guidelines for learner outcomes in K–12 classrooms. These guidelines, published in 1999 by the North American Association for Environmental Education, can aid state and local efforts to provide quality education.

Excellence in Environmental Education—Guidelines for Learning (K–12) outlines core concepts and skills that environmentally literate citizens possess and suggests guidelines and performance measures. Each guideline is linked to relevant national standards in disciplines such as mathematics, language arts, science, and social studies. These links allow environmental education to meet the standards set by traditional disciplines while synthesizing knowledge and experience across disciplines.

Based on a compilation of case studies of schools that use environmental education as the focus for their curriculum, Marcia P. Sward of the National Environmental Education and Training Foundation found "current evidence support-

ENVIRONMENT AS AN INTEGRATING CONTEXT (EIC) AND STUDENT IMPROVEMENT

REPORT OF FINDINGS FROM A STUDY OF 40 SCHOOLS USING EIC-BASED INSTRUCTIONAL STRATEGIES.

General Educational Parameters	% of Educators Reporting Student Improvement in This Area	# of Educators Responding to This Survey Item
Standardized test scores	77%	60
Grade point averages	73%	101
Improved behavior	70%	162
Student engagement and enthusiasm	98%	173
Ability and willingness to stay on task	89%	171
Adaptability to various learning styles	94%	161
Practicing civility toward others	93%	157

Source: Adapted from *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning.* by G. A. Lieberman & L. L. Hoody, 1998. San Diego, CA: State Education and Environment Roundtable.

ing the premise that, compared to traditional educational approaches, environmental-based education improves academic performance across the curriculum" (Glenn, 2000, p. 5). Likewise, a report developed by the North American Association for Environmental Education demonstrated that environmental education can help improve the overall quality of education. In the schools and collaborative programs highlighted in the report,

- Reading scores improved, sometimes spectacularly.
- Math scores improved.
- Students performed better in science and social studies.
- Students developed the ability to make connections and transfer their knowledge from familiar to unfamiliar contexts.
- Students learned to "do science" rather than just "learn about science."
- Classroom discipline problems declined.
- Every child had the opportunity to learn at a high level (Glenn, 2000, pp. 3–4).

The State Education and Environment Roundtable's study of environmental education strategies at 40 schools "indicates that students learn more effectively within an environment-based context than within a traditional educational framework," according to Gerald Lieberman and Linda Hoody. The 12 state education agencies in the roundtable designed the 1998 study, titled *Closing the Achievement Gap: Using the Environment as an Integrating Context for Learning.* Lieberman and Hoody conclude from the study that the comprehensive educational framework used with environment-based curricula appears to have benefits over "traditional compartmentalized approaches." They also find that performance on traditional measures of competence as well as student enthusiasm and motivation tend to increase. The improvement in student performance is often dramatic (1998, p. 2).

One approach that uses environmental education to improve student achievement is Environment as an Integrating Context (EIC). EIC-based instruction uses a school's surroundings and community as a framework and context for learning. EIC strategies use proven constructivist and learner-centered education practices.

Student performance at Hawley Environmental Elementary School in Milwaukee, Wisc., is one illustration of the effectiveness of a rigorous environment-based curriculum. In 1989, this K–5 school suffered from discipline problems and poor academic achievement. The process of creating an integrated environment-based curriculum heightened the professional team spirit of the

school's teachers, according to school staff. The results of implementing and fine-tuning this curriculum are visible in the superior performance of Hawley students on state tests and nationally normed assessments. In 1998, proficiency levels in reading exceeded all other Wisconsin schools located in areas with similar income levels, and also exceeded the statewide average. Proficiency levels in mathematics also dramatically exceeded those of other low-income schools, and hovered near the statewide average (Glenn, 2000).

Challenges to Implementing Environmental Education in Our Schools

Environmental education has long been seen by many teachers as an add-on that is difficult to fit into a crowded schedule. A nationwide Roper-Starch poll, however, showed that 95 percent of parents support teaching environmental education in the schools (2000). According to Kevin Coyle, president of the National Environmental Education and Training Foundation, "It is dramatically clear that nearly every parent supports the idea that our children should be learning about the environment as part of a basic course of study. But it surprised us to learn there are so many other reasons why adults approve of environmental education," including community service experience, improved science learning, and greater respect for the people and places around them (National Environmental Education and Training Foundation, 2001a, p. 1).

Despite its perceived importance, not enough teachers consistently include environmental education in the curricula they teach. According to a nationwide survey of public school teachers, 61 percent say they include environmental topics in their curricula, but the percentage varies dramatically across the grade levels. While 83 percent of K–4 teachers incorporate environmental topics, the percentage drops to 58 percent for 5–8 grade teachers and to only 44 percent for high school teachers. The report also found that only a few environmental topics, such as recycling and solid waste management, are being taught on a regular basis (Survey Research Center, 2000).

To be truly effective, a comprehensive, cohesive environmental education program must be implemented across all grade levels. One reason this is not happening consistently is such programs' lack of inclusion in state-level educational priorities. Although the number of states that committed funding to environmental education increased during the

PROGRESS TOWARD COMPREHENSIVE PROGRAMS: AN OVERVIEW OF STATE INFRASTRUCTURE

Many states are advocating or supporting comprehensive environmental education (EE) programs that are integrated into the formal K–12 curriculum. Here is an overview of how widespread several critical components of this support structure are:

Comprehensive Program Component	Number of States*
Requirements for including EE in curriculum	18
EE learning objectives incorporated into curriculum guidelines	30
Inclusion of EE in statewide assessment strategies	34
EE preservice training requirement for teacher certification	4
Coordinated system of inservice EE training programs	34
State EE funding sources	32
Computerized EE resource network	40

* Refers to number of states in which this program component existed or was being developed in 1998.

Source: Adapted from "A Survey of the Status of State-Level Environmental Education in the United States—1998 Update" by A. Ruskey, R. Wilke, & T. Beasley, Spring 2001. *Journal of Environmental Education,* 32(3).

1990s, nationwide the level of direct funding for in-school offerings is minimal. In 1998, the total amount committed to environmental education programs in 32 states was less than $7.3 million, according to "A Survey of the Status of State-Level Environmental Education in the United States—1998 Update" (Ruskey, Wilke, & Beasley, 2001). Abby Ruskey and her colleagues at the National Environmental Education Advancement Project recognize that committing funds to environmental education is an important step, but they say the current annual investment is "grossly inadequate."

Many educators see teacher training as a missing piece of the puzzle for top-quality, comprehensive environmental education programs. The 1998 state survey revealed that although 15 states required an environmental education component in K–12 curricula and some 30 states offered a coordinated system of environmental education inservice programs, only 4 states included preservice environmental education training as a criteria for teacher certification (Ruskey et al., 2001). In a couple of other states, education leaders are coordinating a more informal, institution-by-institution approach to preservice environmental education training.

A lack of teacher preparation in environmental education was confirmed by the Survey Research Center in its 2000 nationwide survey of teachers. Prior to becoming teachers, only about 10 percent of the respondents had taken courses in environmental teaching methods, and less than a third (26 percent) had prior course work in environmental science, ecology, or environmental studies. Including both preservice and inservice training, 39 percent of teachers had been educated in environmental teaching methods, while 62 percent had received some training in environment-related subject areas (Survey Research Center, 2000).

According to Rick Wilke, University of Wisconsin Distinguished Professor of Environmental Education, "Preservice training helps teachers provide more and higher quality instruction, and capitalize on the use of environmental education to enhance student learning in other disciplines and contribute to education reform." Wilke's research involving Wisconsin teachers demonstrated that "the majority of preservice teachers indicated they would not have taken a course in environmental education if it were not required. After completing the course, nearly 80 percent said the preservice environmental education course had contributed as much or more to their teacher training than any other course they took."

Linking Environmental Education and Formal Education

Educators and researchers have worked hard to demonstrate the relevance of environmental education to the larger field of K–12 formal education. Strengthening this connection is one of the goals of the Environmental Education and Training Partnership (EETAP). EETAP is funded by the U.S. Environmental Protection Agency's (EPA) Office of Environmental Education as authorized under the National Environmental Education Act. Since 1995, this collaboration of some 20 partner organizations across the country has promoted the link between environmental education and traditional subject areas and provided tools to help educators realize the potential of environmental education to further the cause of education reform (Archie, 2001). To this end,

- The three largest national environmental education projects (Project WET, Project Learning Tree, and Project WILD) have correlated their curriculum materials to national and state standards, and have incorporated these links into educator workshops (Archie, 2001). These correlations save educators time when they develop classroom activities and plan curricula.
- Twenty-one states, as of 1998, had model environmental education programs in place to test and demonstrate environmental education as a vehicle for achieving school improvement goals (Ruskey et al., 2001).
- Nineteen states, as of 1998, had correlated their state content standards with the goals and objectives of environmental education, identifying learner outcomes, objectives, benchmarks, and essential skills that also fit within a model environmental education curriculum. Fourteen additional states were developing these correlations (Ruskey et al., 2001).
- Professional associations have made the link between environmental education and education reform a focal point for state and national gatherings such as the 1999 conference of the North American Association for Environmental Education.

Ongoing EETAP goals include forging partnerships among environmental education organizations and formal education professional associations such as ASCD. These partnerships will further strengthen the links between environmental education and education reform, and create

opportunities for learning, discussion, and advancement of mutual goals (Archie, 2001).

Sustaining Programs

Environmental education practitioners point to waxing and waning support from the federal government as an ongoing challenge to sustaining meaningful environmental education programs at state and local levels. The first National Environmental Education Act was passed in 1970, when public support for environmental protection was at a high point. This act was limited in scope, partially funded from 1971 to 1975, and not reauthorized in 1981. In 1990, Congress passed and President George H.W. Bush signed into law the 1990 National Environmental Education Act, marking renewed federal support for environmental education (Braus & Disinger, 1998).

State environmental education associations, centers, and coalitions often spearhead efforts to develop and sustain comprehensive environmental education programs and provide professional development services. Professional associations dedicated to environmental education are established in 47 states, and statewide environmental education centers are active in 18 states. The original push to build support for environmental education programs was focused on the state level, because educational policy and direction is largely set there. Now that a good number of states have developed significant infrastructure and support, many environmental education supporters believe it is time to give more attention to the local level, where the "educational rubber" hits the road. Ruskey writes, "Without question, the extent to which we will achieve environmental literacy and environmental sustainability will be the extent to which local level [environmental education] programs are developed and institutionalized" (2000).

An Agenda for Increased Focus

In the past year, a number of organizations have issued recommendations for creating and sustaining strong environmental education programs nationwide. Among these are the National Council for Science, Policy and the Environment (2000), the National Environmental Education and Training Foundation (2001b), and the National Environmental Education Advisory Council (2000). Although each report offers varied advice, common recommendations have emerged, such as the following:

- Congress should reauthorize the National Environmental Education Act and increase funding and other resources for EPA to administer this program.
- Congress and EPA should strengthen EPA's Office of Environmental Education by consolidating all agency education programs and projects into this office, and mandate a senior-level federal task force that sets environmental education policy and strategy for the federal government.
- Congress and the U.S. Department of Education should establish an Office of Environmental Education within the department to serve as a link with EPA.
- EPA and the U.S. Department of Education, along with major national education organizations and institutions, should support the establishment of an education and environment partnership to demonstrate the effectiveness of using the environment as an integrating context for improving student learning. This partnership would be modeled after the Arts Education Partnership supported by the Education Department, the National Endowment for the Arts, and other educational institutions.

Simmons of the National Project for Excellence in Environmental Education notes, "Although there is certainly room for improvement, many elements of the infrastructure to support top-quality environmental education programs have been put in place. Within this context, superintendents, principals, curriculum directors, and teachers are critical players in incorporating environmental education as a comprehensive, cohesive part of the K–12 curriculum. The extent to which environmental

THE ASCD POSITION ON ENVIRONMENTAL EDUCATION

Because people in developed nations are rapidly consuming Earth's natural resources and because the world population is increasing rapidly, human beings must take individual and social responsibility for the environment. Schools should provide environmental education.

What We Believe: Positions of the Association for Supervision and Curriculum Development. Revised 2001. Alexandria, VA: Association for Supervision and Curriculum Development.

education is included in state standards and testing, as well as in preservice teacher training, will be strongly influenced by the demand generated school by school, district by district." Environmental education proponents believe that students, schools, and the community all win when the engaging and effective approaches of environment-based learning are brought into the education mainstream.

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Environmental Education Resources

Environmental Education and Training Partnership
http://www.eetap.org
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University of Wisconsin-Stevens Point
Stevens Point, WI 54481
715-346-4958

Environmental Literacy Council
http://www.enviroliteracy.org
1730 K Street, N.W., Suite 905
Washington, DC 20006-3868
202-296-0390

National Council for Science and the Environment
http://cnie.org
1725 K Street NW, Suite 212
Washington, DC 20006-1401
202-530-5810

National Environmental Education Advancement Project
http://www.uwsp.edu/cnr/neeap
College of Natural Resources
University of Wisconsin-Stevens Point
Stevens Point, WI 54481
715-346-4748

National Environmental Education and Training Foundation
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National Project for Excellence in Environmental Education
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